

Abstract of the Disclosure

A microfabricated device employing a bridging membrane and methods for electrokinetic transport of a liquid phase biological or chemical material using the same are described. The bridging membrane is deployed in or adjacent to a 5 microchannel and permits either ionic current flow or the transport of gas species, while inhibiting the bulk flow of material. The use of bridging membranes in accordance with this invention is applicable to a variety of processes, including electrokinetically induced pressure flow in a region of a microchannel that is not influenced by an electric field, sample concentration enhancement and injection, 10 as well as improving the analysis of materials where it is desired to eliminate electrophoretic bias. Other applications of the bridging membranes according to this invention include the separation of species from a sample material, valving of fluids in a microchannel network, mixing of different materials in a microchannel, and the pumping of fluids.